Z1 PATCH PANEL RECONFIGURATION POWERDOWN

1. VERIFY P6 POWER GENERATION STATUS

PCS P6: EPS

P6:EPS

'ENERGY STORAGE 4B'

√Batt SOC 1 > 80%
√Batt SOC 2 > 80%
√Batt SOC 3 > 80%

'Energy Storage 2B'

√Batt SOC 1 > 80%
√Batt SOC 2 > 80%
√Batt SOC 3 > 80%

'DCSU 4B'

√Bus Voltage: 143 --- 165 V

'DCSU 2B'

√Bus Voltage: 143 --- 165 V

'P6: EPS: Bottom Left Corner'

√DDCU 4B Output Pwr + Channel 4B Output Power < TBD

'P6: EPS: Bottom Right Corner'

√DDCU 2B Output Pwr + Channel 2B Output Power < TBD

'DDCU 4B'

√Output Pwr < 3 kW

'DDCU 2B'

√Output Pwr < 3 kW

2. VERIFY UP-STREAM INHIBIT

EPS: Z1 CONNECTOR PATCH PANEL RECONFIG

Z1 CONNECTOR PATCH PANEL RECONFIG

'RPCM 2B-B'

√RPC1 Position - Op

'RPCM 4B-B'

√RPC1 Position - Op

NOTE
This procedure assumes that MDM N1-2 is Primary and MDM N1-1 is Secondary.

3. INHIBIT NCS AUTORETRY
   'Primary NCS'

   cmd Auto Retry - Inhibit

   √Auto Retry - Inh

4. COMMAND N1-1 TO DIAGNOSTICS

NOTE
Expect PCS FDA message 'CDH MDM N1-2 Detected RT Fail MDM N1-1 - PMA1'.

   'N1-1 MDM'

   cmd Auth Xtion Diagnostic State - Ena
   cmd Diagnostic State - Transition

   'Secondary NCS'

   √Frame Count: 'Not Incrementing'

5. REMOVE POWER FROM SDO CARD AND N1-1 MDM
   'N1-1 MDM'

   cmd RPCM N1RS1 A RPC 05 - Open
   √Position - Op
   cmd RPCM N1RS1 A RPC 11 - Open
   √Position - Op

6. DISABLE RT DEVICES I/O ON EPS BUSES
   'UB EPS_N1-14'

   cmd PCU_2 - Inh
   cmd N1RS1_A - Inh
   cmd N1RS1_B - Inh
   cmd N1RS1_C - Inh
   cmd Z14B_A - Inh
   cmd Z14B_B - Inh

   √RT Inhibit 28, 20, 19, 18, 12, 11 (six) – Inh

7. COMMAND FGB RACU 6 OFF

NOTE
Station crew must perform this step. If not crew performed, √**MCC-H**.

'FGB EPS'

cmd RACU 6 - Off
√RACU 6 Power - Off
√RACU 6 Input Current < 2.0 A
√RACU 6 Output Voltage ~0.0 V

Notify EV, Go For Patch Panel 4B
Cable W05-P1 →|← J3

On EV GO

8. SUPPLY POWER TO Z1 LOADS
'Z14B SPDA Power Control'

cmd RPCM 4B-B RPC 1 - Close
√Position - Cl

9. VERIFY FGB POWER GENERATION STATUS
'FGB EPS'

√Main Bus Voltage 1,2 (two): 28.0 --- 29.0
√Battery Voltage 1 --- 6 (six, along bottom) > 25.5

****
* If any Battery Voltage < 25.5 V *
* Notify **MCC:** "FGB Batteries low. *
* Wait 1 rev for FGB battery charge."*
****

10. COMMAND RACU 6 ON
On MCC GO

NOTE
Station crew must perform this step. If not crew performed, √**MCC-H**.

'FGB EPS'

cmd RACU 6 - On

√Converter - On
√Input Current > 2.0
√Output Current > 0.3
√Output Voltage: 121 --- 125

Crew inform **MCC-H**, “RACU 6 Power On at ___/__:__:__ GMT.”

```
****************************************
*  If Output Current > 10 Amps         *
*       sel   Commands                 *
*       cmd RACU 6 - Off  Execute      *
*                                      *
*     √MCC-H                           *
****************************************
```

11. VERIFY N1-1 TRANSITION TO STANDBY

NOTE
MDM may take up to 5 minutes to warm-up and go through POST.

‘Secondary NCS’

√Major State - Standby

12. COMMAND N1-1 MDM TO SECONDARY

‘N1-1 MDM’

cmd Secondary State - Transition

‘Secondary NCS’

√Major State - Secondary

13. ENABLE RT DEVICES I/O ON RACU 6 EPS BUSES

```
*********************************************
*  If N1-2 powerdown will be delayed        *
*                                           *
*       ‘Primary NCS’                       *
*                                           *
*       cmd Auto Retry - Ena                *
*     √Auto Retry - Ena                     *
*********************************************
```

‘UB EPS N1 14’

cmd N1RS1_A - Ena
cmd N1RS1_B - Ena
cmd N1RS1_C - Ena

√RT Inhibited 20, 19, 18 (three) - blank

14. PROVIDE POWER TO MDM SDO CARD

‘N1-1 MDM’

cmd RPC 5 - Close
√Position - Cl

15. REACTIVATE EARLY COMM HEATERS

NOTE
The Early Comm equipment is powered by the Stbd CBM RPCs.

'ECOMM Heaters'

sel RPC [X] [X] = 6 13 5

cmd RPC [X] - Close
√Position – Cl

Repeat

16. INHIBIT NCS AUTORETRY
'Secondary NCS'

cmd Auto Retry - Inh

√Auto Retry - Inh

17. COMMAND N1-2 TO DIAGNOSTICS

NOTE
1. Expect 'Disconnect' message on PCS. 2. Possible PDI DECOM Fail message.

'N1-2 MDM'

cmd Auth Xtion Diagnostic State - Ena
cmd Diagnostic State - Trasnsition

Wait 20 seconds for transition.

NOTE
Perform step 18 if no comm with **MCC-H**. If not crew performed, INCO will perform step 18.

18. TELEMETRY RECOVERY ON OIU

CRT SM 212 OIU

BUS 4 BC - ITEM 15 EXEC (∗)
BUS 3 RT - ITEM 10 EXEC (∗)
Change OIU N1 Phys Dev to N1-1 - ITEM 18 +4 EXEC

Wait 1 minute from diagnostic command.
CRT Reload OIU Format 2 - ITEM 1 +2 EXEC

19. TELEMETRY RECOVERY ON PCS

PCS On PCS attached to UOP (PDIP) N1-1 port

sel icon to open PCS CDS Main Control Panel Window
√status box - yellow
sel 'Connect to MDM'
√status box - green
Verify 'connected to MDM' indicated.

Home page will display when load complete (~1 minute).

NOTE
Expect PCS FDA 'CDH MDM N1-1 Detected RT Fail MDM N1-2 - PMA1'.

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1
'MDM Major State'

√State - Primary

```
**********************************************
*  If State not Primary or no N1-1 TLM  *
*                                       *
*     √MCC                              *
**********************************************
```

20. REMOVE POWER FROM N1-2 MDM AT RPC
EPS: Z1 CONNECTOR PATCH PANEL RECONFIG
Z1 CONNECTOR PATCH PANEL RECONFIG

NOTE
Expect PCS FDA (LED and message only) when MDM power removed.

'N1-2 MDM'

sel RPC 03
cmd RPCM N1RS2 C RPC 3 - Open
√Position - Op

cmd RPCM N1RS2 C RPC 13 - Open
√Position - Op

21. DISABLE RT DEVICES I/O ON EPS BUSES
'UB EPS_N1 23'

cmd PCU_1 - Inh
cmd N1RS2_A - Inh
cmd N1RS2_B - Inh
cmd N1RS2_C - Inh
cmd Z13B_A - Inh
cmd Z13B_B - Inh

√RT Inhibit 28, 20, 19, 18, 12, 11 (five) - Inh

22. COMMAND FGB RACU 5 OFF

NOTE
Station crew must perform this step. If not crew performed, √**MCC-H**.

'FGB EPS'

cmd RACU 5 - Off
√RACU 5 Converter - Off
√RACU 5 Input Current < 2.0 A
√RACU 5 Output Voltage ~0.0 V

Notify EV, Go for Patch Panel 3B
Cable W10-P1 →|← J3

On EV GO
23. SUPPLY POWER TO Z1 LOADS
'Z13B SPDA Power Control'

cmd RPCM 4B-B RPC1 - Close
√Position - Cl

24. VERIFY FGB POWER GENERATION STATUS
'FGB EPS'

√Main Bus Voltage 1,2 (two): 28.0 --- 29.0
√Battery Voltage 1 --- 6 (six along bottom) > 25.5

****
* If any Battery Voltage < 25.5 V *
* Notify **MCC-H:** "FGB Batteries low. *
* Wait 1 rev for FGB battery charge."*
****

25. COMMAND RACU 5 ON
On MCC GO

NOTE
Station crew must perform this step. If not crew performed, √**MCC-H**.

'FGB EPS'

cmd RACU 5 - On
√RACU 5 Converter On
√Input Current > 2.0
√Output Current > 0.3
√Output Voltage: 121 --- 125

Crew inform **MCC-H**, "RACU 5 Power On at ___/__:__:__ GMT."

```
****************************************
*  If Output Current > 10 Amps       *
*       sel    Commands              *
*       cmd RACU 5 - Off  Execute    *
*                                    *
*     √MCC-H                         *
****************************************
```

26. VERIFY N1-2 IN STANDBY

NOTE
MDM may take up to 5 minutes to warmup and go through POST.

'Secondary NCS'

√Major State - Standby

```
*****************************
*  If State not Standby,   *
*                          *
      √MCC-H
*****************************
```

27. COMMAND N1-1 TO STANDBY

NOTE
Expect PDI DECOM Fail message. After commanding N1-1 to Standby it could take as long as 3 minutes for N1-2 to become Primary.

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node1
'MDM Major State'

sel Commands
00:05:00 **cmd** Prim_NCS_Xsitn_Stby_State **Execute**

28. TELEMETRY RECOVERY ON PCS AND OIU

CRT SM 212 OIU

BUS 3 BC - ITEM 11 EXEC (*)
BUS 4 RT - ITEM 14 EXEC (*)
Change OIU N1 Phys Dev to N1-2 - ITEM 18 +3 EXEC

Wait 1 minute from command to standby.

NOTE
Expect PDI DECOM Fail message.

Reload OIU FORMAT - ITEM 1 +2 EXEC

29. TELEMETRY RECOVERY ON PCS

PCS On PCS attached to PDIP N1-2 port

sel icon to open PCS CDS Main Control Panel Window
√status box - yellow
sel 'Connect to MDM'
√status box - green
Verify 'connected to MDM' indicated.

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1
'MDM Major State'

√State - Primary

30. COMMAND N1-1 MDM TO SECONDARY
'N1-1 MDM'

cmd Secondary State - Transition

'Secondary NCS'

√Major State - Secondary

31. VERIFY RT DEVICES I/O ON EPS BUSES
'UB EPS_N1-23'

√RT Inhibited 18, 19, 20 (three) - blank

32. ENABLE N1-1 MDM NCS AUTO RETRY
'Secondary NCS'

cmd Auto Retry - Ena
√Auto Retry - Ena

33. PROVIDE POWER TO MDM N1-2 SDO CARD
'N1-2 MDM'

cmd RPCM N1RS2 C RPC 3 - Close
√Position - Cl

NOTE
Perform following steps if no comm with **MCC-H**. If not crew performed, **MCC-H** can complete the procedure.

34. VERIFY RPCM POWER BUS CONNECTIVITY

Node 1: EPS NODE1: EPS

√N1RS1 A, B, C (three) - Active (blue buttons)
√N1RS2 A, B, C (three) - Active (blue buttons)

Node 1: EPS NODE1: EPS

√Z13B A, B (two) - Active (blue buttons)
√Z14B A, B (two) - Active (blue buttons)

****
* If any RPCM not active, √**MCC-H**. *
****

35. ENABLE NODE 1 A HEATERS TO BACK-UP
Node 1: TCS
Node1:TCS
'NODE 1'

sel Nod1 Htr[X]A [X] = 1 2 3 4 5 6 7 8 9

sel Htr Commands (right side)
cmd Htr[X]A Ena Bkup **Execute**
√Nod1 Htr[X]A Availbty - Ena Bkup

Repeat

36. INHIBIT PMA1 B HEATERS
Node 1: TCS
Node1:TCS
'PMA1'

sel PMA1 Htr[X]B [X] = 1 2 3 5

sel Htr Commands (right side)
cmd Htr[X]B Ena Bkup **Execute**
√Nod1 Htr[X]B Availbty - Ena Bkup

Repeat

NOTE
The PMA 1 and Node 1 Heater set points will be commanded by **MCC-H**.

37. ACTIVATE Z1 HEATERS
Z1: EPS: RPCM Z13B-B
RPCM Z13B-B

sel RPC [X] X = 6 7 10 11 12 16

sel Commands
cmd Close **Execute**
√Position – Cl

Repeat

Z1: EPS: RPCM Z14B-B
RPCM N1ZB-B

sel RPC [X] X = 2 3 4 5 6 7 10 11 12 14 16

sel Commands
cmd Close **Execute**
√Position - Cl

Repeat

Z1: EPS
Z1-3B Rail Heaters

sel Z1 [X] X = 3B 4B

cmd Z1[X] Htr A Ena Opr
√Status - Inh

Repeat

Z1: EPS

Z1-4B Rail Heaters

sel Z1 [X] X = 3B 4B

cmd Z1[X] Htr B Ena Bu

√Status - Inh

Repeat